

that tho' the double croiffure has many advantages in compacting the silk thread, and shaking off its moisture, yet without such contrivance it will scarce ever be put in practice. I must also take notice, that this contrivance is vastly more simple than that which Mons. Vaucançon uses, tho' his has no one of these advantages. A description of his method may be seen in the treatise which I lately published on the culture of silk, for the use of our American colonies, sold by Mr. Millar in the Strand ; but I had not at that time thought of these improvements.

N. B. In *Tab. III. fig. 2.* the swivel-cross is represented somewhat large, and separate from the reel, the better to distinguish its parts ; but at *B, fig. 1.* it is shewn in its true proportion and situation when the reel is ready to work.

V. *Experiments on several Pieces of Marble stained by Mr. Robert Chambers. In a Letter to the Rev. Thomas Birch, D. D. Secret. R. S. from Mr. Emanuel Mendez da Costa, F. R. S.*

Rev. Sir,

Read Feb. 8, 1759. I Take the liberty to address to you some notices on the art of staining or painting of marble, and the experiments I made on those pieces of painted marble produced before this Society, at their meetings on the 21st December and 11th January last. The

The artist, whom I also introduced at the same time to the Society, is Mr. Robert Chambers, of Minching-Hampton in Gloucestershire; and at my desire he was present at the experiments I made on his said painted marbles.

But before I relate the experiments, it may not be improper to give some little historical account of the art itself: it will at least be amusing to the Society.

Kircher, in his *Mundus Subterraneus*, lib. viii. sect. 1. c. 9. p. 45 & 46. is the first author I know, who mentions it. There was, says he, an artist at Rome, who painted several pieces of marble, in an elegant manner, for Pope Urban VIII. He would not discover his art; therefore Kircher strove by many experiments to discover it: and he made colours, *viz.* tinctures of metals and minerals, which coloured the marble as finely as any the artist had done, and quite penetrated the stone; insomuch that a slab cut horizontally made as many pictures as pieces or sections. Kircher gives at large the process he used for making the colours; and observes, they should always be of a mineral origin: which I incline also to believe would answer much the best.

The said author (*Ibid.*) also gives another method to colour marble, by vitriol, bitumen, &c. forming a design of what you like upon paper, and laying the said design between two pieces of polished marble; then closing all the interstices with wax, you bury them for a month or two in a damp place. On taking them up, you will find, that the design you painted on the paper has penetrated the marbles, and formed exactly the same design on them. A modern author,

author, Wallerius, in his *Mineralogy*, vol ii. gen. 58. p. 128. also recommends this method.

In the *Philosophical Transactions*, N°. 7. the first method of Kircher is copied. The editor however therein says, that method has not since been tried. He adds, that one Mr. Bird had for many years (he writes in 1666) found out a way to sink colours a considerable depth into polished marble; pieces whereof were shewn to King Charles II. soon after his restoration; and, being broken in his presence, it was found, that the colours had penetrated deep into the marbles; and that many works of his coloured marbles were seen at Oxford and London. But Mr. Bird's way of doing it is not mentioned.

In the *Philosophical Transactions*, N°. 268 is a paper, intituled, "The Way of Colouring Marble." The anonymous author gives us an account of the colours, &c. he used. It is observable they are only vegetable colours. His red, he says, he extracted again from the marble, without hurting the polish, within six and twenty hours, with oil of tartar *per deliquium*; and his brown was quite discharged by aquafortis within one quarter of an hour, and the polish of the marble quite destroyed.

I shall now proceed to give an account of the experiments I made. I could not well suggest any more, as the method of colouring the marble, the materials of the colours, &c. are kept secret by the artist, Mr Chambers.

A piece of marble, with the several colours used, on it, like a painter's pallet, being greatly saturated with aquafortis, at different times, for twenty hours, tho'

tho' the polish of the marble was quite effaced, yet there was not the least discharge of any of the colours, nor were they any-wise dulled, &c.

N°. 6. A deep crimson-red colour, being left twenty hours in a strong lye of common soft green soap, suffered no change; and boiled in the same lye half an hour, also suffered no change. The marble finely powdered, and aqua fortis effused over it, the marble particles were nigh destroyed; but several red particles (no doubt the colour) remained. The marble, by common calcination, *i. e.* in a common coal fire, for half an hour, is intirely discharged of its colour. We made the experiments on four other reds, and the result was much the same as abovesaid; so that this is a standard for his reds.

N°. 5. A deep sea-green, being left twenty hours in a strong lye of common soft green soap, suffered no change; but boiled in the same lye it quite discharged its green colour: however, it yet remained slightly tinctured yellowish. By common calcination the colour was quite discharged. Some other greens were tried, and answered much the same.

N°. 10. 15. & 16. Brownish or terrestrial yellowish colours, near to a clay colour, boiled in a strong lye of common soft green soap, they suffered no change. By common calcination the colours were discharged, but retained a greyish cast. These colours, covered for forty-eight hours with a layer of the said common soap, suffered no sensible change.

N°. 19. A bright yellow, boiled in a strong lye of common green soft soap, suffered no change; and covered with a layer of the same soap for forty-eight hours, the colour is dulled. By common cal-

cination the colours are discharged, but retain a greyish cast. Several other different shades of yellow answered much the same by my experiments.

For blue, Mr. Chambers has not as yet stained any marble of that colour.

By the above experiments we may conclude, that these colours are good, penetrate the marble freely without injuring it, remain uninjured by menstrua, &c.; and that only calcination discharges them. Therefore it is probable, that Mr. Chambers's method of staining or colouring marbles is extremely good.

Tho' acid menstrua work greatly on marble, yet it is observable these colours are not discharged by them, but only by calcination; which, as it intirely and thoroughly destroys the compages of the stone, the substances of the colours must undoubtedly at the same time be exhaled by the force of the fire. We observe a like process in the works of nature; viz. in the dendritæ; I mean, such as are on alcaline stones: for tho' the stones are utterly corroded by the acids, yet the dendritæ, however merely superficial, remain; but if calcined, the said dendritæ are immediately exhaled, and intirely disappear.

This art will not only give pleasure to the eye by regular paintings (whereas the natural colourings of marble are very irregular), but it may be very useful to blazon arms, and for inscriptions; as sculpture alone can never express colours, and chissel'd inscriptions, &c. suffer much by age: for probably a monument of marble, rightly coloured by this method, will be preserved ages from the injuries of the weather, tho'

tho' at the same time the stone itself will be somewhat hurt or corroded by the air.

I have the honour to be,

Reverend Sir,

Your very obliged and humble Servant,

Bearbinder-lane,
7th February 1759. Emanuel Mendez da Costa.

VI. *Observations upon the Sea Scolopendre, or Sea Millepes. By John Andrew Peysfonel, M. D. F. R. S. Translated from the French.*

Read Feb. 15, 1759. **T**HIS creature, in its figure, is like the Land Scolopendre, or, as Pliny says, to the hairy caterpillar, commonly called the Milleped animal. It is of the same colour, has the same arrangement of circular rings: but whereas the Land Scolopendre is flat, this is square. I counted eighty rings, which form the body and head, when it was brought to me. This sea insect was very small, and almost imperceptible. I was surprised, after having kept him some time, to see a round body, of a blackish green colour, like the *glans virilis*, pass out of him, which had a considerable opening, like the canal of the urethra. This gland was surrounded by two bodies or bowels, which appeared in form of a prepuce turned back; the one was yellowish, and the other whitish; each but a